

CLAIMS:

1. A video viewing system, comprising:

- an input (10) for receiving an incoming video stream;
 - an output (12) for outputting an outgoing video stream;
 - a storage device (18) for storing video data;
- 5 - a plurality of FIFO communication buffers (16a-d);
- a processing system (14a-f, 15) arranged to execute a plurality of tasks, including an input task (20) coupled to the input, a decoding task (22) coupled to the output, a recording task (24) for recording on the storage device (18) and a replay task (26) for replaying from the storage device (18), the processing system (14a-f, 15) being switchable between a plurality of
10 video modes, including a live play mode in which the input task (20) is coupled to the decoding task (22), a pause mode in which the input task (20) is coupled to the recording task (24), and a time-shift mode in which the input task (20) is coupled to the recording task (24) and the replay task (26) is coupled to the decoding task (20), the tasks being coupled via respective ones of the FIFO communication buffers (16a-d), the processing system (14a-f,
15) being arranged to switch between the video modes by reassigning connections of tasks (20, 22, 24, 26) to the respective ones of the FIFO communication buffers (16a-d), keeping previous video data in the reassigned FIFO communication buffers (16a-d), keeping tasks (20, 22, 24, 26) that are needed before and after a switch continuously active and ceasing execution of tasks that are not in use after the switch.

20

2. A video viewing system as claimed in claim 1, wherein the processing system (14a-f, 15) is arranged to send a "freeze" signal to the decoder task (22) upon a mode switch from the live play mode to the pause mode, to make the decoder task (22) enter a freeze state in which the decoder task (22) permanently outputs a current video frame.

25

3. A video viewing system as claimed in claim 2, wherein the input task (20) is coupled to the decoder task (22) via a first one of the FIFO communication buffers (16a-d) in the live play mode, the processing system (14a-f, 15) being arranged to decouple an input of the decoder task (22) from an output of the first one of the FIFO communication buffers

(16a-d) upon switching from the live play mode to the pause mode, to couple an input of the recording task (24) to the output of the first one of the FIFO communication buffers (16a-d) and subsequently to activate the recording task (24).

5 4. A video viewing system as claimed in claim 3, wherein the processing system (14a-f, 15) is arranged to couple an output of the replay task (26) to an input of a second one of the FIFO communication buffers (16a-d) upon a video mode switch from the pause mode to the time-shift mode, to couple an input of the decoder task (22) to an output of the second one of the FIFO communication buffers (16a-d) and subsequently to activate the replay task
10 (26), the decoder task (22) being switched back from the freeze state to a normal operating state.

15 5. A video viewing system as claimed in claim 1, wherein the input task (20) is coupled to the decoder task (22) via a first one of the FIFO communication buffers (16a-d) in the live play mode, the processing system (14a-f, 15) being arranged to couple a second one of the FIFO communication buffers (16a-d) between the input task (20) and the recording task (24) upon switching from the live play mode to the pause mode, an input of the first one of the FIFO communication buffers (16a-d) being disconnected from the input task (20) and an output of the first one of the FIFO communication buffers (16a-d) remaining coupled to an
20 input of the decoder task (22).

25 6. A video viewing system as claimed in claim 1, wherein the input task (20) is coupled to the recording task (22) in the time shift mode via a first one of the FIFO communication buffers (16a-d), the processing system (14a-f, 15) being arranged to reconnect an input of the decoder task (22) to an output of the first one of the FIFO communication buffers (16a-d) upon a video mode switch from the time shift mode to the live play mode, deactivating the replay task (26) and the recording task (24).

30 7. A video viewing system as claimed in claim 1, wherein the input task (20) is coupled to the recording task (24) in the time shift mode via a first one of the FIFO communication buffers (16a-d), and the replay task is coupled to the decoder task via a second one of the FIFO communication buffers, the processing system (14a-f, 15) being arranged to deactivate the replay task (26), to deactivate the recording task (24), to couple a second one of the FIFO communication buffers (16a-d) to the input task and to release the

first one of the FIFO communication buffers (16a-d) upon a switch from the time shift mode to the live play mode.

8. A video viewing system as claimed in claim 1, wherein each task (20, 22, 24, 26) that is deactivated upon mode switching is arranged to delay deactivation upon mode switching until it has processed a closed group of pictures and written or read that group to or from one of the FIFO communication buffers (16a-d).

9. A video viewing system as claimed in claim 1, wherein at least one of the replay task (26) and recording task (24) is implemented as a computer program running on a programmable computer, so that resources used by said at least one of the replay task (26) and recording task (24) are released in a video mode or modes when said at least one of the replay task (26) and recording task (24) is not active.

10. 10. A video viewing system as claimed in claim 1, wherein at least one of the replay task (26) and recording task (24) is implemented in dedicated hardware, the dedicated hardware being switchable to a power-saving state, the dedicated hardware for said at least one of the replay task (26) and recording task (24) being released in a video mode or modes when said at least one of the replay task (26) and recording task (24) is not active.

20

11. A method of producing an outgoing video stream for viewing, wherein a plurality of tasks (20, 22, 24, 26) is executed, including an input task (20) receiving an incoming video stream, a decoding task (22) outputting the outgoing video stream, a recording task (24) recording on a storage device (18) and a replay task (26) replaying from the storage device (18),

the method comprising the steps of:

- switching between a plurality of video modes, different subsets of the tasks (20, 22, 24, 26) or all of the tasks (20, 22, 24, 26) being active in different ones of the modes, the video modes including a live play mode in which the input task (20) is coupled to the decoding task (22), a pause mode in which the input task (20) is coupled to the recording task (24), and a time-shift mode in which the input task (20) is coupled to the recording task (24) and the replay task (26) is coupled to the decoding task (22),
- using FIFO communication buffers (16a-d) to communicate between the tasks (20, 22, 24, 26), switching between the video modes being realized by reassigning connections of tasks

(20, 22, 24, 26) to respective ones of the communication buffers (16a-d), keeping previous data in the reassigned FIFO communication buffers (16a-d), keeping tasks (20, 22, 24, 26) that are needed before and after a switch continuously active and ceasing execution of tasks (20, 22, 24, 26) that are not in use after the switch.

5

12. A computer program product comprising a program of computer instructions for making a programmable computer perform the method of claim 11.